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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,852	05/26/2006	Fumito Takeuchi	1000023-000108	5655

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EXAMINER
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SELLERS, ROBERT E

ART UNIT	PAPER NUMBER
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1796

NOTIFICATION DATE	DELIVERY MODE
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10/16/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/580,852	<b>Applicant(s)</b> TAKEUCHI ET AL.	
	<b>Examiner</b> ROBERT SELLERS	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 4-7,9,10,12,13,15 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 11 and 14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-16 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/26/2006 &amp; 2/4/2008</u> .                                | 6) <input type="checkbox"/> Other: _____                          |

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 1-5, 8, 11 and 14, drawn to a composition comprising an epoxy resin, a (meth)acrylic ester monomer or oligomer, a latent curing agent, a photo radical initiator, a polythiol, and, optionally, a partially esterified epoxy resin (claims 4 and 5).

Group II, claims 6, 9, 12 and 15, drawn to a process for producing a liquid crystal display panel.

Group III, claims 7, 10, 13 and 16, drawn to a liquid crystal display panel.

2. The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical feature. The special technical feature is the combination of epoxy resin, (meth)acrylic monomer or oligomer and polythiol.

3. Miyawaki et al. Publication No. 2006/0009579 (page 10, Example 1) shows a light and heat curable liquid crystal sealing agent composition (page 10, paragraph 131) comprising 34 parts by weight per 100 parts by weight of the components (phr) of the elected species of o-cresol novolak epoxy resin, 45.4 phr of the elected species of pentaerythritol triacrylate, 13.6 phr of a blend of the elected species of Amicure VDH-J and Curezol 2E4MZ-A, and 4.5 parts by weight of the elected species of Iragure 184.

Art Unit: 1796

The claimed polythiol in a proportion of from 0.001 to 5.0 parts by weight per 100 parts by weight of the epoxy resin is not recited.

4. Irving et al. Patent No. 4,836,878 (col. 2, lines 50-61) sets forth a composition containing a free-radical polymerizable compound such as trimethylolpropane trimethacrylate (col. 11, lines 31-32, Acrylic ester III) or pentaerythritol tetrakis(dimethylene glycol acrylate) (col. 4, lines 2-3), an epoxide resin and a polymercaptan curing agent such as the elected species of an ester of 2- or 3-mercaptopropionic acid and trimethylolpropane (col. 10, lines 15-21) in an amount of from 0.01 to 0.5 part by weight per part by weight of epoxide resin, or from 0.1% to 33% by weight.

5. It would have been obvious to incorporate from 0.1% to 33% by weight of the polymercaptan curing agent of Irving et al. into the composition of Miyawaki et al. in order to increase the cure rate at lower temperatures as recognized by Slocki et al. Patent No. 4,383,090 (col. 1, lines 43-45).

Accordingly, the special technical feature does not make a contribution over the prior art, thereby validating a holding of lack of unity.

Art Unit: 1796

6. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

- (1) The epoxy resins.
- (2) The (meth)acrylic ester monomers or oligomers.
- (3) The latent curing agents.
- (4) The photo radical initiators.
- (5) The polythiols.
- (6) The presence or absence of the partially esterified epoxy resin of claims 4 and 5, wherein if its presence is elected, a particular species is identified.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species (MPEP § 809.02(a)).

Claims 1-16 are generic.

Art Unit: 1796

7. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the reasons espoused with respect to the holding of lack of unity hereinabove.

8. During a telephone conversation with Robert G. Mukai on September 29, 2008, a provisional election was made with traverse to prosecute the invention of Group I and the following species involving claims 1-3, 8, 11 and 14:

(1) o-cresol novolac epoxy resin EOCN-1020-75 from Example 1 in Table 1 on pages 57-59.

(2) pentaerythritol triacrylate.

(3) 1,3-bis(hydrazinocarboethyl)-5-isopropyl hydantoin Amicure VDH-J and 2,4-diamino-60[2'-methylimidazolyl-(1')]-ethyl-s-triazine isocyanuric acid adduct Curezole 2E4MZ-A.

(4) 1-hydroxy-cyclohexylphenyl ketone Irgacure 184.

(5) trimethylolpropane tris(3-mercaptopropionate).

(6) The absence of the partially esterified epoxy resin is not present in Example 1.

Claims 6, 7, 9, 10, 12, 13, 15 and 16 are withdrawn from further consideration under 37 CFR 1.142(b), as being drawn to non-elected inventions. Claims 4 and 5 are withdrawn to the non-elected species of the presence of the partially esterified epoxy resin (6).

Art Unit: 1796

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5, 8, 11 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyawaki et al. Publication No. 2006/9999579 in view of Irving et al. Patent No. 4,836,878 and Slocki et al. Patent No. 4,383,090.

9. Miyawaki et al. Publication No. 2006/0009579 (page 10, Example 1) shows a light and heat curable liquid crystal sealing agent composition (page 10, paragraph 131) comprising 34 parts by weight per 100 parts by weight of the components (phr) of the elected species of o-cresol novolak epoxy resin, 45.4 phr of the elected species of pentaerythritol triacrylate, 13.6 phr of a blend of the elected species of Amicure VDH-J and Curezol 2E4MZ-A, and 4.5 parts by weight of the elected species of Iragure 184.

The claimed polythiol in a proportion of from 0.001 to 5.0 parts by weight per 100 parts by weight of the epoxy resin is not recited.

Art Unit: 1796

10. Irving et al. Patent No. 4,836,878 (col. 2, lines 50-61) sets forth a composition containing a free-radical polymerizable compound such as trimethylolpropane trimethacrylate (col. 11, lines 31-32, Acrylic ester III) or pentaerythritol tetrakis(dimethylene glycol acrylate) (col. 4, lines 2-3), an epoxide resin and a polymercaptan curing agent such as the elected species of an ester of 2- or 3-mercaptopropionic acid and trimethylolpropane (col. 10, lines 15-21) in an amount of from 0.01 to 0.5 part by weight per part by weight of epoxide resin, or from 0.1% to 33% by weight.

11. Slocki et al. teaches the use of a polymercaptan to quicken the cure rate in mixtures of polyepoxide resins and polyacrylate esters (col. 1, lines 43-45 and col. 2, lines 42-43) such as pentaerythritol triacrylate (col. 6, lines 9-10).

12. It would have been obvious to incorporate from 0.1% to 33% by weight of the polymercaptan curing agent of Irving et al. into the composition of Miyawaki et al. in order to increase the cure rate at lower temperatures as recognized by Slocki et al. (col. 1, lines 43-45).



The prior art made of record and not relied upon is considered pertinent to the disclosure.

13. Tahara et al. Patent No. 5,665,797 in columns 10-11, Tables 1 and 2, Comparative Example 8 shows a composition for sealing liquid crystal panels (col. 10, lines 17-18) comprising a polysulfide-modified epoxy resin C (footnote 7), an acrylic ester graft polymer (A-1) (col. 8, Synthesis Example 1), and a polythiol curing agent at an exemplified amount outside of the claimed limits.

14. Kitamura et al. reports a sealant composition for a liquid crystal display cell (col. 2, line 50 to col. 3, line 1) prepared from an epoxy resin and from 10 to 50% by weight of a curing agent of a tetrafunctional mercapto compound (2A-1) such as preferably pentaerythritol tetrakis(3-mercaptopropionate (col. 3, lines 15-17) possessing an ionic conductivity of 0.6 mS/m or less to inhibit the migration of free ions from the cured product to the liquid crystal phase (col. 13, lines 16-23 and 41-51).

15. Sakata et al. teaches a formulation useful as a sealing agent (col. 13, line 12) obtained from an epoxy resin such as an epoxidized cresol novolac resin (col. 2, line 49) and a polythiol such as the elected species of trimethylolpropane tris( $\beta$ -thiopropionate) (col. 8, lines 21-22, TMTP). However, the lowest quantity exhibited in Table 2 (col. 10) is 30.13 parts by weight per 100 parts by weight of the epoxy resin.

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rs  
10/10/2008